REMARKS

Reexamination and reconsideration of claim 8 is respectfully requested. Applicants acknowledge with appreciation the allowance of claims 1-5, 7, and 9-15.

The drawings were objected to under 37 C.F.R. 1.83(a) for not showing every feature of the invention specified in the claims. Applicants amended claims 5, 10, 11, and 12, thereby making it clear that the optical fibers are optically interconnected. Additionally, Applicants would like to remind the Primary Examiner of the proposed drawings submitted in the Reply dated May 14, 2003 showing the optical connection between optical fibers. Withdrawal of the objection to the drawings is respectfully requested.

Claim 8 was rejected under 35 U.S.C. sec. 103(a) applying U.S. Pat. No. 5,343,549 ('549) in view of U.S. Pat. No. 6,005,458 ('458). For patents to be applicable under sec. 103(a), the combination of teachings must, *inter alia*, expressly or inherently, teach, disclose, or suggest each and every feature of the claimed invention. Additionally, motivation and suggestion to combine the patents must be present.

It is respectfully submitted that the Office Action misinterpreted the '549 patent. Moreover, the applied art, taken alone or in combination with the other art of record, does not implicitly or expressly teach, disclose, or suggest all of the features of claim 8. Specifically, the Office Action states that "Nave et al. in figure 1, discloses a cable with two layers. Since the fiber in each of the tubes are similarly constructed, they will have essentially the same length." See p. 3 of the Office Action dated December 15, 2003. This statement is incorrect and misinterprets the '549 patent.

The skilled artisan would have understood that the outer layer of tubes in the '549 patent are located radially outward of the first layer of tubes. See Fig. 1 of the '549 patent. In

other words, the outer layer of tubes of the '549 patent is located at a greater radial distance from the center than the inner layer of tubes ($R_{outer}>R_{inner}$). See Fig. 1 of the '549 patent. Since the outer layer of tubes is stranded at a larger radial distance than the inner layer of tubes, the outer layer of tubes has a longer length within the cable for the same lay length. Because the outer layer of tubes has a longer length than the inner layer of tubes with the same lay length, the optical fibers in the outer layer of tubes of the '549 patent are longer than the optical fibers in the first layer of tubes for a given length of cable.

The fact that the outer layer of tubes is longer for the same lay length can be shown by mathematical equations. As objective evidence of this fact, Applicants again submit herewith an excerpt from the book Fiber Optic Cables, Mahlke and Gossing, 1997 (the "textbook"). Specifically, page 120 of the textbook describes the concept of stranding elements along with the related geometry and equations. See p. 120 of the textbook. More specifically, the equation (labeled "B") on page 120 of the textbook illustrates that the length of a stranded element such as a buffer tube is a function of the stranding radius R.

In other words, as the stranding radius R increases so does the length L of the stranded element for the same lay length. See the equation labeled B in the textbook. Since the outer tubes of the '549 patent have a larger stranding radius they have a longer length than the inner tubes of the '549 patent. From this it follows that optical fibers within the outer layer of tubes are longer that the optical fibers within the inner layer of tubes. In other words, the optical fibers of the different layers of the '549 patent have different overall lengths. Thus, the Office Action misinterpreted the '549 patent. Moreover, since the purported combination does not teach each and every feature of claim 8, the Office Action failed to make a *prima*

facie case. For at least these reasons, withdrawal of the sec. 103(a) rejection of claim 8 is warranted and is respectfully requested.

No fees are believed due in connection with this Reply. If any fees are due in connection with this Reply, please charge any fees, or credit any overpayment, to Deposit Account Number 19-2167.

Allowance of all pending claims is believed to be warranted and is respectfully requested.

The Examiner is welcomed to telephone the undersigned to discuss the merits of this patent application.

Respectfully submitted,

Michael E. Carroll, Jr.

Michael E. Carroll, Jr.
Attorney
Reg. No. 46,602
P.O. Box 489
Hickory, N. C. 28603
Telephone: 828/901-6725

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Fiber Optic Cables

Fundamentals
Cable Engineering
Systems Planning

By Günther Mahlke and Peter Gössing

3rd, revised and enlarged edition, 1997

Siemens Aktiengesellschaft

Die Deutsche Bibliothek – CIP-Einheitsaufnahme

Mahlke, Günther:
Fiber optic cables : fundamentals, cable engineering, systems planning / by Günther Mahlke and Peter Gössing. Siemens-Aktiengesellschaft. – 3. rev. and enl. ed. – Erlangen: Publicis-MCD-Verl., 1997
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3rd edition, 1997

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Publisher: Publicis MCD Verlag, Erlangen

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Preface

During the past year
in the field of comm
cable technology, her
waveguides – also ca
the availability of su
emitting diodes and p
tems already in oper
fiber technology.

This book is intended
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The third edition co
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principles has been u
chapters cover tight l
and aerial cables. Th
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detailed glossary of

This revised edition
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maining true to the s

Grateful acknowledg
persons, who contri
S. Kirchmann, A. Kr

May 1997

In helical stranding the stranding elements form a screw-type line comparable to a spiral staircase. Its length of pitch after a full turn of 360° is called the *lay length S*. The angle between the stranding elements and the cable cross-section is called the slope of stranding or *stranding angle* α. The distance between the axis of the cable and the middle of the stranding element is called the *stranding radius R*. Therefore the length L of a stranding element and the stranding angle α (Figure 9.8) can be calculated as

$$L = S\sqrt{1 + \left(\frac{2\pi R}{S}\right)^2};$$

(B)

$$\alpha = \arctan \frac{S}{2\pi R},$$

- R stranding radius in mm
- L length of stranding element in mm
- S lay length in mm
- α stranding angle in degrees
- $2\pi R$ circumference of the stranding circle.

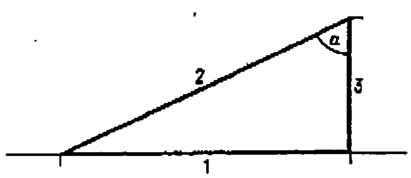
Because of stranding, the stranding elements must be longer than would be necessary if they were parallel to the longitudinal axis. The excess length due to stranding is given in per cent:

$$Z = \frac{L - S}{S} \times 100\% = \left\{\sqrt{1 + \left(\frac{2\pi R}{S}\right)^2} - 1\right\} \times 100\%$$

(A)

$$= \left(\frac{1}{\sin\alpha} - 1\right) \times 100\%,$$

Z excess length due to stranding in %.



- α Stranding angle α
- 1 Lay length S
- 2 Length L of stranding element
- 3 Circumference of the stranding circle $2\pi R$

Figure 9.8
Interdependence of lay length, stranding angle and the length of the stranding elements

The screw line or h
or *bending radius* c

$\varrho = R\{1 + ($

ϱ bending radius in

For the strength and
tant that it should n
permissible radius
the bending radius
length is

$S = 2\pi R\sqrt{\frac{\varrho}{R}}$

Example

In an optical cable
stranding radius R =
as

$Z = \{\sqrt{1 +}$

Therefore for each
longer

The stranding angle

$\alpha = \arctan \frac{S}{2\pi}$

The corresponding l

$\varrho = 4.3\{1 +$

In reverse lay strand
reaches a maximum
them.

In Figure 9.9 the be
fixed stranding radiu
stranding and, for co

In practical applicati
ing for the reverse l